4:Grajdanzev--173 S-4 (no date) 1942 Formosans -1-2
116, 744, 759, 177.74 Japan
636.74

"In all books and articles published under the auspices of the Japanese government the remarkable successes of the Taiwan government with respect to the health of the population are described, and there is no doubt that improvements took place in Taiwan after 1896—it would be strange if this were not so. More than 300,000 Japanese live there now and their health depends to an important degree upon the health of the surrounding population, especially in case of epidemic diseases. First of all, for the sake of comparison, we give the basic figures for Taiwan and Japan.

Number of Physicians, Dentists, etc. in Japan and in Taiwan, 1936

	Japan	Taiwan	
	1936	1936	1938
Physicians	61,799	1,834	1,983
Dentists	22,072	402	407
Pharmacists (yakusaishi)	28,156	190	213
Nurses	124,402	...	170
Midwives	61,732	1,744	1,796
	Per 10,000 of population		
Physicians	8.8	3.4	
Dentists	3.1	0.7	
Pharmacists	4.0	0.3	

4:Grajdanzev--173 S-4 (no date) 1942 Formosans-2
116. 744. 759. 177.74 Japan
636.74

Nurses	17.7	0.3
Midwives	8.8	3.2

Source: Dainippon teikoku nenkan and Taiwan Jijo."

4:Grajdanzev--173-174 S-4 (no date) 1942 Formosans
116, 171, 278, 744, 759

"In the section on education it was shown that Chinese college students from Taiwan prefer to study medicine because this is a profession in which it is relatively easier to establish oneself than in others. Now we see that in spite of this attraction [174] there are two and a half times as many physicians per 10,000 population in Japan as there are in Taiwan. The same is true of midwives, though the need for midwives is greater in Taiwan, where the birth rate is one and a half times as high as in Japan. On the same per capita basis there are four times as many dentists and thirteen times as many pharmacists in Japan as in Taiwan. These and many other figures which could be quoted show that as regards health services Japan is several times better served than Taiwan. And actual conditions are even worse than these figures suggest because the equipment of hospitals is poorer and the physicians rely chiefly on advice and prepared drugs, which are sold by some 6,600 stores as well as 6,700 peddlers."

15: U.S. Navy --26 [13]
116, 625, 556, 744, 177.74
636.74

(no date) 1944

Formosans
Japanese

"The Japanese policeman undertakes to instruct rural peoples in sanitation, house-building, religious observance and many other things elsewhere usually left to private initiative. Large-scale public works projects have raised the whole standard of health and public welfare. Extremes of wealth and poverty are not very apparent in normal times."

15: U.S. Navy--28 [2] (no date) 1944 Formosans
116, 744, 177.74 Japanese
636.74

"Compulsory house-cleaning as a public health measure is rigorously enforced by the Japanese. Towns and country districts are systematically organized for semi-annual house-cleaning days and cooperation is expected of everyone. The movable contents of every house and most shops must be taken out into the open air and the premises must be cleaned thoroughly. Before replacement a police inspection is obligatory, and a certificate of approval must be issued and posted at the door of each building."

15: U.S. Navy--28 [3]
116, 515, 735, 744, 177.74
636.74

(no date) 1944

Formosans
Japanese

"General standards of personal cleanliness are not high, but the universal shabbiness must be attributed to poverty rather than to sheer neglect. The principles of elementary hygiene are not widely understood. The Japanese have been making some progress in establishing habits of public cleanliness and have been trying to introduce new measures of household hygiene (careful disposal of waste, daily bathing). The problem is very great, however, among six million people. Although general standards are lower than the average in America, they are as high as standards maintained in backward districts in the South or in city slums, and are infinitely better than standards existing among Chinese villages on the China coast across the Straits of Taiwan."

designs -- actually built -- was opened in October 1955 in Taipei.[8] The model houses are built of reinforced concrete, kiln brick wall, cement or brick floor, new style tile roof, and are equipped with electricity and running water. The houses range from four-to seven-room units. The best and most expensive type of design provides for a living room, three bedrooms, a kitchen, a dining room, and a bathroom equipped with flush-toilet -- rarely found in Formosan homes. It is believed that the self-help, low-cost housing program as well as the efforts of NHC will go a long way toward improving housing conditions in Formosa.

II. ENVIRONMENTAL SANITATION

A. General Sanitary Conditions

Climate and economic conditions are the main determinants of the living environment of the Formosan people. Although sanitation is being constantly improved, it is still far from adequate and, with the housing situation, presents a most serious problem in the field of public health. The long summers, relatively warm weather throughout the year, and usually abundant rainfall, provide conditions favorable to the spread of communicable diseases. The rapid increase of population, especially in urban areas, unmatched by proportionate expansion of housing, public sanitation, and fresh water supply facilities has created such new problems as congestion in living quarters, lack of sufficient water, and shortage of public toilets. These conditions aggravate the previously existing situation of poor housing, drainage systems, and waste-disposal facilities.

8. Chung-yang Jih-pao [Central Daily News], Oct. 17, 1950.

B. Specific Conditions and Problems

744 Few homes in Formosa are equipped with modern facilities. Brick stoves burning charcoal are the most common medium for cooking and heating; oil and kerosene lamps provide most of the lighting. Smoke from both these sources is a polluting agent within and outside the home, particularly in the rural areas. According to a recent study, 15 per cent of urban homes and 40 per cent of rural homes are not equipped with electric lighting, to say nothing of other electrical facilities.[9] Drinking water is piped into only about 30 per cent of urban houses and less than 15 per cent of rural dwellings; about one-third of urban households and two-thirds of rural homes obtain water for drinking and cooking from wells; and the rest of the households get their water from irrigation ditches, streams, and springs.[10] Towns under 20,000 population generally do not have a system for piping water into homes.[11] Some wells have pumps, but most are open to pollution by dirt, insects, and the runoff of surface water. Flush-type toilets are rare, only about 1 per cent of urban dwellings have such a facility; the majority of households use inside or outside privies, periodically emptied of night-soil for disposal as fertilizer.

744 362 Sewer systems in towns and cities are networks of open drains designed to carry storm runoff and waste water from domestic and industrial sources. The brick or cement gutters, from one to four feet deep, are generally located between the street and the sidewalk. Occasional cross drains lead into

9. A.F.Raper and others, op.cit., p. 348.
10. Ibid., p. 349.
11. [next page]

744 362 trunk lines, which empty into open canals. Most urban centers have a system of high-level canals bringing in fresh water, and another network of low-level canals carrying away waste water. However, it is a common sight to see children swimming and women washing clothes or vegetables in low-level canals. Often garbage, night-soil, and other refuse are dumped into the fresh-water canals. Some municipal authorities are now considering elimination of open sewage systems with all their disadvantages, but the enormity of the job and financial difficulties preclude any immediate fulfillment of such plans. For instance, the municipality of Taipei is contemplating the construction of an underground drainage system costing hundreds of millions of Formosan dollars and requiring more than ten years to complete.[12]

744 514 The scarcity of chemical fertilizers and the average farmer's lack of financial resources necessitates the use of all organic refuse materials from human and animal sources to enrich the soil. The consumption of raw vegetables fertilized by unprocessed night soil is a primary cause of the spread of intestinal diseases. In addition the use of night soil presents problems of collection and disposal. In cities, human excrement from one or more households is often stored in water-tight vaults. The contents are periodically emptied by

11. E. A. Turner, "Environmental Sanitary Conditions in Taiwan," Chinese American Economic Cooperation, Volume II, No. 2, Feb. 1953, pp. 51-65.

12. Central Daily News, Jan. 11, 1955.

long-handled dippers into wooden buckets and carried to collectors' carts for transportation to reservoirs outside the city. There the night soil is sterilized before being distributed to rural areas. In the countryside, human excrement is usually taken directly from the privies and applied to the soil without processing.

Refuse of all kinds is extensively utilized. Private or municipal collectors of refuse carefully sort waste material to salvage and resell as much of it as possible. Organic waste is used for composting fertilizer; paper, rags, glass, and metals are sold for scrap. While waiting for disposal, the compost piles and junk heaps provide breeding places for disease, rats, and insects. Other breeding places for diseases and their carriers are provided by waste accumulation in the streets and back yards of cities; the number of workers engaged in the collection and disposal of night soil and refuse is insufficient for prompt waste disposal. In Taipei, for instance, while the population was doubling in the 1950-54 period, the number of night-soil collectors [13] increased only from 410 to 428. However, under the cooperative efforts of the American MSMC, the JCRR, and government agencies, more efficient and sanitary methods for the collection and disposal of waste materials are being adopted.

The problem of sanitation is complicated by public ignorance concerning it. Although the people

13. The Central Daily News, Jan. 21, 1955.

744 are being made increasingly conscious of the need for sanitation, such unsanitary habits are still common as spitting in public places, discarding waste onto streets, dumping refuse in open sewers, and permitting chickens to wander freely through homes. Garbage cans are scarce, and the too-few public toilets are often not kept clean. In an attempt to improve the situation, the provincial government has organized the Committee for Supervision and Guidance of Environmental Sanitation. The committee is divided into small groups which tour the island to inspect sanitation facilities and to direct the improvement of them in all government agencies, schools, public meeting places, public markets, and slaughter houses.[14] Each local government also has a similar committee to formulate sanitation policies. However, government assistance in improving public sanitation is limited by lack of sufficient finances. In the municipality of Taipei, only 8.37 per cent of the 1954 budget was allocated for all public health needs, of which environmental sanitation was only a part.[15] Government efforts are supplemented by the work of various social organizations, such as the Women's Association, in improving public sanitation.

As will be discussed in the following section, considerable advances have been made in the improvement of health and medical facilities and in the prevention and control of disease, leaving environmental sanitation as the major challenge in the field of public health.

14. T'ai-wan Sheng-cheng-fu Kung-pao [The Official Gazette of the Taiwan Provincial Government], Feb. 21, 1955.

15. The Central Daily News, Jan. 30, 1955.

III. PUBLIC HEALTH PROBLEMS

A. General Background

744 B1 Many of the communicable diseases usually associated with a tropical and sub-tropical climate were common to Formosa until the end of the nineteenth century. At that time, Formosa was still commonly called the island of epidemics. Plague, cholera, and smallpox caused the most serious epidemics; malaria, dysentery, typhus, and pneumonia were widespread but less prevalent. The control and prevention of these diseases became a major task of the Japanese administration which took over control of the island in 1895. The activities of the health bureau were closely coordinated with the exercise of the police power. Such measures as enforced vaccination, isolation of patients, destruction of contaminated houses, elimination of rats, and strict quarantine at seaports brought quick results. Since 1920, no major epidemics have occurred on Formosa.[16] Preventive activities against venereal diseases, parasitic diseases, trachoma, tuberculosis, and leprosy were begun by the Japanese in the late 1920's. By 1942, deaths from contagious and other diseases among Chinese inhabitants of Formosa had been reduced to the following yearly rate:[17] tuberculosis, 4,834; malaria, 5,792, parasitic diseases, 5,775; tracheitis, 4,661; pneumonia, 18,922; diarrhea and intestinal inflammation, 14,789; and kidney disease, 5,993. The least results were achieved in controlling tuberculosis, malaria,

744 B4

16. Shao-hsing Chen, "Population Growth and Social Change in Taiwan," Bulletin of the Department of Archeology and Anthropology, Nat'l. Taiwan Univ., Taipei, May 1955, pp. 76-103.

17. [next page]

764 medical facilities, training of personnel and
144 distribution of medical supplies have been effected through the joint undertakings of Chinese Government, United States, and international agencies, namely, the American MSMC, American Board for Medical Aid to China, Sino-American JCRR, World Health Organization (WHO), and United Nations International Children's Emergency Fund (UNICEF). The decline in the death rate during the 1948-53 period from 14.3 to 9.5 per 1,000 population[18] is clear evidence of the advances made by these joint efforts.

B. Specific Measures

744 Malaria. The Japanese in the last years of their malaria-control program maintained 375 malaria stations throughout the island for the administration of suppressive drugs. During the war the efforts were discontinued and an epidemic broke out in the post-war years. The Malaria Eradication Program begun in 1952 under the joint sponsorship of the Provincial Government, WHO, MSMC, and JCRR, arrives at complete elimination of the disease from the island by the end of 1956. By early 1956, the program had provided direct protection against malaria to more than 5,500,000 residents of formerly malarial areas.[19] The control program is carried out through (1) continuous checking and study of malaria parasites and treatment of malaria patients in the rehabilitated 144 malaria control stations throughout the island, and (2) the planned residual spraying with DDT of all dwellings in

18. See Table 8 in chapter on Population.

19. Mutual Security Mission to China, International Cooperation Adm., The Public Health Program on Taiwan (unpublished pamphlet), Taipei, 1955, p. 6.

744 malaria-affected areas to break the cycle of infection.

Tuberculosis. This is one of the most serious and crippling diseases in Formosa; one out of every ten deaths on the island is attributed to tuberculosis.[20] The control program has mainly employed a preventive technique, giving tuberculin tests, mass chest surveys, and BCG vaccination shots (believed to increase the resistance of infants and children against tuberculosis). The JCRR assisted the government in constructing and equipping a laboratory for productic of BCG vaccine, and the Taipei Tuberculosis Center, a unit of the Provincial Health Administration (PHA), has been acting as a sponsoring agency for extensive vaccination. Hospitals, rural health centers and stations and mobile units co-operate in carrying out this program. As of 1955, all school children had received tuberculin tests, and youngsters showing negative reactions were given BCG vaccinations. Testing and vaccination have now been extended to pre-school children.

Serum and vaccine production. The Taiwan Serum and Vaccine Laboratory, organized with JCRR assistance after World War II, has since received help from JCRR, WHO, UNICEF, and MSMC. Through co-operation with the National Taiwan University School of Medicine, the laboratory is now able to produce most of the serum and vaccine needed for the population. In 1952, the

20. A. F. Raper, Rural Taiwan -- Problem and Promise, Taipei, Joint Commission on Rural Reconstruction, 1953, p. 230.

744 laboratory manufactured smallpox vaccine for 8,800,000 persons and distributed it free to 350 health stations. In the same year, mixed vaccine against cholera and typhoid was produced for 2,355,000 persons and issued to the health stations for free inoculations.[21]

Other programs. Campaigns against trachoma through examination and treatment of school children; the control of venereal diseases through education, periodic examinations, and treatment; and the establishment of a blood bank to meet emergency needs; all are being carried out through the co-operation of various governmental, United States, and international agencies. In addition, the provincial government operates a leprosy colony for the custodial care of some 700 patients.

C. Medical Education

874 There are currently three medical schools and two college-level nursing schools in Formosa -- the National Taiwan University School of Medicine, the National Defense Medical College, and the non-Government Takau Medical College; the National Army Defense Nursing Schools and the Provincial Technical School of Nursing.

The National Taiwan University (NTU) School of Medicine is the island's highest medical institution. It trains dentists and pharmacists as well as physicians and surgeons. The doctoral

21. China Handbook 1953-54, Taipei China Publishing Company, 1953, p. 140.

874 training for nurses will begin in 1956 with the ex[illegible]tion of graduating forty nurses with B.S. degrees yearly after 1960. In addition, nine nurses have received training in the United States under the technical assistance program; three are scheduled to enter the program in 1956 and seven in 1957. In Formosa, the Provincial Health Administration is also conducting seminars for hospital administrators, chief nurses, and head nurses.

D. Outlook

744 Today, the major challenge in the field of public health lies in environmental sanitation. The problem entails, in particular, the improvement of waste collection and disposal, of food sanitation in private homes, food stands, and restaurants, and of insect and rodent control. Concentration of attention in these areas is vital to maintain the present general level of the population's health as well as to reinforce the curative and preventive accomplishments already made in the treatment of specific diseases.

Since the improvement of environmental sanitation is closely related to a higher standard of living, the attainment of completely satisfactory conditions will be a long and hard pull. Under the co-operative efforts of the government, the United States, and international agencies, Formosa has made great advances in health work and looks forward to achieving a clean and healthy community free from major diseases in the not too distant

744 future. Before attaining this goal, however, health education will have to be ex ded to all classes of the people, and the economy made stable and prosperous.

IV. MEDICAL FACILITIES AND PERSONNEL

759 Formosa is better provided with professional medical personnel and better equipped with medical and health facilities than the average Asian nation. The latest reports on medical personnel and facilities on the island show the following situation:

LICENSED MEDICAL PERSONNEL -- FORMOSA 1953 *

Physicians	5,443
Herbalists	1,755
Dentists	781
Pharmacists	906
Nurses	877
Midwives	2,310
Dental technicians	234
Druggists	327
Total	12,633

*/ [illegible] Taipei

759 been trained in Western countries; the doctors who have not are capable of providing treatment equivalent to that of their Western counterparts except for the administering of the newest medicines. Many of the midwives are well trained and capable of efficient practice in their specialty.

744 Health centers at 22 cities under hsien and provincial administration and health stations at more than 350 townships and villages throughout the island provide a network of medical facilities for the administration of preventive and curative measures on a mass basis.[26] A health center is usually staffed with from 20 to 25 persons, including four or five physicians, three to six nurses, two or three midwives, and one or two laboratory technicians. The health stations are branch units of the health centers; a typical health station has a physician, a nurse, a midwife, a sanitarian, and a technician. Since 1954, the provincial government has established 120 sub-stations in aboriginal villages to extend its health services; a sub-station is permanently staffed with an attendant nurse and a midwife. In addition to out-patient clinical care, the health centers and stations provide obstetrical services, home and school visits by nurses, preventive inoculations, health education, laboratory services, and mobile clinical treatment in neighboring villages. The centers and stations also gather and compile vital statistics. The stations are now an integral part of rural communities and are financially self-supporting.

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26. Mutual Security Mission to China, International Co-operation Administration, op. cit., p. 5. The number of health stations is constantly increasing.

only to furnish their labor and then to give from their limited incomes to pay for the increasingly heavy fertilizer input that insured heavy yields three times a year from the same land. Taiwan was thus transformed into a garden island where only the most venturesome of weeds could grow. Increasing quantities of rice, sugar and tropical products were transported northward to meet the growing food deficits of Japan's increasing population.

PUBLIC HEALTH AND MEDICAL CARE

The Sanitary Bureau of the Police Department was the authority in public health. Administration and enforcement were supported by police power. In the prewar years there were about 2,000 qualified doctors. Many others were trained in Taiwan and given local licenses. At the end of the war there were some 5,000 to 6,000 local doctors, or almost one per thousand population. Since public posts and private practice were limited, many of these doctors were unemployed. In 1948 about 3,600 physicians were registered as engaged in private practice or public service. There were about 600 nurses and numerous midwives. In both these groups the majority were substandard in grade. The number of hospital beds included approximately 1,000 in the capital and perhaps 6,000 on the Island, most of them in small units. In 1948 effective hospital capacity was less than half this prewar level.

Under Japanese control plague was eliminated and cholera and smallpox became rare, although the last two recurred in 1946 to 1947. Tropical diseases are common, malaria in particular. The Japanese had a special malaria service, based on extensive blood examinations, which administered quinine to positive cases. By these means 30 to 40 per cent of the people were examined annually and malaria mortality was reduced by treatment. This suppression improved the health record temporarily, but it did not contribute to permanent amelioration. The program has since been largely discontinued.

THE INCREASE OF THE POPULATION

Population increase paralleled economic expansion. In 1905 there were 3.0 million people on the Island; in 1940, there were 5.9 million. Population thus increased 93 per cent in this 35-year period and virtually all

48: Chen E-4 (no date) 1955 ADI Formosa ADI

Hitherto the development of chemical production, heavy industry, and consumer goods industries on Taiwan had declined, but now they were earnestly promoted. This gave another impetus to social change.

8. Elimination of Epidemics

After the occupation of Taiwan, two things troubled the Japanese most: the revolts of the Taiwanese and epidemics. One branch of the Japanese expeditionary army landed on the Pescadores on March 21, 1895. By mid-May, fully 1945 people out of 6,190 were afflicted by cholera, and 1,247 died. Another branch of the expeditionary army landed on Taiwan at about the same time and was also stricken with cholera, malaria, dysentry, typhus, pneumonia, and beri-beri. Only one fifth of the total army was free from illness by the end of September (5: Vol. 2, No. 12). During the early years of the Japanese occupation epidemics spread widely, and thus, elimination of epidemics was the first administrative task for the new rulers of Taiwan.

Plague, cholera, and small-pox were three serious epidemics in Taiwan. Plague broke out in Hongkong in 1894, invaded in Taiwan two years later, and had spread to many places during the next twenty-two years. During this time more than thirty thousand people were inflicted, and twenty-four thousand died. It was wiped out in 1917 (5: Vol. 2, No. 12). The activities of extermination and prevention by police power were conspicuous. They included the isolation of patients, destruction and burning of contaminated houses, extermination of rats, quarantine at sea ports etc. Though the means adopted were harsh and cruel, they were effective. Cholera was not as serious as plague in Taiwan. A greater prevalence of cholera occured in 1902, 1912, 1913, and 1920. After 1921 the preventative arrangements were more or less completed and by the cooperation of the people and the public health system, the occurence of cholera could be closely controlled.

During the early years of Japanese occupation small-pox was a serious problem. With the enforcement of vaccination, it began to decline after 1903. Since then, except for a greater prevalence in 1918–1920, small-pox has not been a menance in Taiwan (5: Vol. 2, No. 12).

Plague was wiped out in 1917. Cholera and small-pox were under control by 1920. Since then there has been no serious problem of epidemics in Taiwan. Incidentally, the cattle pest which ravaged Taiwan from 1896 and killed more than forty thousand head of cattle, was also exterminated in 1920.[7]

Whether or not a society is menaced by epidemic is always a significant social fact. We may say that freedom from epidemics is the first step toward modernization. In Taiwan, the course of this change can be traced in the data of population change. Before 1920 the death rate was high, and it also fluctuated frequently, and the extent of fluctuation was great. This is a sign of the uncertainty of life. In fact, living in a society where epidemics constantly spread, one could not estimate in the morning what would be happen before nightfall. Fatalism, such as shown in the saying "man proposes,

Note 7: Animal Resources of Taiwan, published by the Bank of Taiwan, 1962, p. 172, p. 296.

48: Chen E-4 (no date) 1955 ADI Formosa ADI

but God disposes", "Der Mensch denkt, und Gott lenkt", "Der Mensch schaltet, Gott waltet", was fostered under such circumstances. In Taiwan there was a saying: Confucius did not accept an invitation for the next day, since he didn't know whether he would be still alive in the evening or not. Under these circumstances, the attitude of the people is always "looking backward", and planning for the future will be laughed at as utopian. Once epidemics were wiped out, the death rate not only lowered, but its fluctuation became more infrequent and of lesser extent. This is a sign of more stability of life, and thus the traditional fatalism gradually dies out. The attitude of the people changes from "looking backward" to "looking forward", and planning for the future becomes a realistic idea. Ancestor worship and all kinds of cult and ritual are the main concern of people who are always looking backward, but for the peole who are looking forward, the upbringing and education of the younger generation is the most important.

9. Prevention of Endemic Disease

Malaria was the main endemic of Taiwan. Though epidemics are disastrous enough, their prevalence is intermittent, and the extent of their devastation is not necessarily very large. In contrast, malaria creeps in slowly, destroys vitality and attacks human life directly and indirectly. From the time of the Japanese occupation (1895) until 1916, about one tenth of all the deaths in Taiwan were caused by malaria, and during this period it was always the first or second in rank among the leading causes of death. Unaccustomed to the climate of Taiwan, the Japanese in Taiwan had to pay a heavy toll to malaria. In 1899 for instance, one quarter of the total deaths of Japanese in Taiwan were caused by malaria. In 1907, under the supervision of a professor of medicine, prevention of malaria was started by a camphor manufacturing corporation in a village of southern Taiwan, and some results were obtained. Preventative activity by the government-general was started at Peito, a town near Taipei, in 1910. As it was found effective, the regulations for the prevention of malaria were enacted in 1913, and were enforced through the system of police and paochia. The area of prevalence was designated, inhabitants within the area were compelled to have a blood test, and the patients were compelled to take medicine. The use of mosquito nets, drainage, and other sanitary works were enforced. The means adopted were harsh, but the result was good. The malaria death rate began to decline after 1916, considerable improvement has been made since 1925, and as a result the crude death rate was lowered. (cf. Fig. 11).

10. Activities of Preventive Hygiene

The devastation from epidemics and malaria was great, and thus the activities for their prevention were begun first. Some simple facilities for patients of leprosy and mental disease were also provided in earlier years. Other diseases, such as tuberculosis, venereal diseases, trachoma, and parasitic diseases, did not show any serious devastation, and they were not considered as serious problems by the government. The administration in Taiwan was mainly an imitation of that in Japan. What they had

48: Chen E-4 (no date) 1955 AD1 Formosa AD1

done in Japan was adopted in Taiwan with some slight time lapse. In 1916 a hygienic survey was made in Japan, and five years later, in 1921, the same project was adopted in Taiwan. Between 1922 and 1925, and also from 1926 to 1928, an extensive hygienic survey was carried out in various parts of the island. After the results were published the planning of sanitary works was mostly based on the data of the survey.

The prevention of trachoma was started around 1926, and was most active in the 1930's. The prevention of tuberculosis began from 1932. The Association for the Prevention of Tuberculosis was organized in 1934, Regulations for the Prevention of Tuberculosis were enacted in 1938, Tuberculosis Prevention Day was initiated in 1939, and a sanatorium was constructed in most prefectures, most of them being completed in 1942–43. These activities were quite effective, and the death rate from tuberculosis declined after 1938 (cf. Fig. 11, line D.) Activities of tuberculosis prevention were started in the U. S. in 1890, and as a result, deaths from tuberculosis declined sharply. It has been pointed out by a social scientist that, though the improvement in living conditions will lower the death rate from tuberculosis, community preventive activity is also very significant (20: p. 631). It is interesting to note that, this was true both in the U. S. and in Taiwan.

The preventive activities against venereal disease, mental disease, parasitic disease, and leprosy were also started by the 1930's. For the administration of these activities, a section of preventive hygiene was added to the Health Department of the government-general in 1935. This may be taken as a sign that more emphasis was put on preventive hygiene.

11. Sanitary Facilities and Medical Personnel

Various kinds of basic sanitary facilities such as drainage, water supply, disposal of garbage and night-soil, supervision of slaughter-houses and markets, inspection of food and businesses such as barber shops, restaurants, and hotels were started rather early. These were started in the cities, particularly in the wards of the city which were largely occupied by the Japanese, and gradually extended to wider areas. The establishment of public hospitals and public doctors was also early in time. Naturally, these were established first and foremost for the benefit of the Japanese in Taiwan. Japanese business men in Taiwan had enjoyed various kinds of privileges, Japanese officers received an allowance 60% greater than that of their brothers at home, and all of them could utilize these public facilities. This was the reason why their death rate was not only lower than the death rate of Japan proper, but even comparable to that of the most advanced countries in the world.

Before the Japanese occupation there were a few hospitals operated by Christian missions. Physicians in these hospitals were the only doctors of western medicine, and other physicians were doctors who practiced Chinese medicine. Some Japanese doctors of western medicine came to Taiwan after the occupation, but their number was very small. In response to the urgent need for medical personnel, training classes for doctors and nurses were set up in Taipei Hospital in 1897. The medical training class

48: Chen E-4 (no date) 1955 AD1 Formosa AD1

matters of sanitation, and at times on matters of agriculture. With the passage of time, experience lead them to compare their traditional way of life with that imposed by the colonial government. Some of these ways were found to be not too bad, some even adoptable. This kind of change in attitude through hard experience was fairly significant. By this, people realized for the first time that there were another ways of life besides their traditional one, and that some elements were worthy of adoption. Once the people began to adopt the new way of life, change began to speed up. From the following instances we can see that change in the attitude of people became conspicuous after the 1920's. We have discussed the influence of war and peace, the prevalence of epidemics, and the development of transportation on the attitude of the people (§ 7, 8, 12). Here the change of attitude concerning medical treatment and agriculture will be discussed.

Since treatment of illness touches the innermost part of life, it is only natural that conservative people do not dare to allow an unfamiliar doctor with strange ways of treatment to approach them. For Taiwanese, who had been accustomed to the traditional Chinese medicine and folk medicine, doctors of western medicine, particularly with their injections and operations, were dreaded. During the early years of the Japanese rule there was a prevalence of cholera. Colonial officers compelled the people to take the preventive injection. Great consternation arose among the people, and many of them, particularly young girls, escaped and hid, in order not to have the dreaded injection. In the old city of Tainan a young girl of a wealthy family was escaping in a palanquin, but unfortunately she was caught by a Japanese police on the way, and forced to take the injection. Perhaps because the shock was too great, she died in a short time. Another young girl who took the injection killed herself after she went home, because it was a dreadful shame for a young girl of high standing to expose a part of her body to the public gaze. When a person died, his family had to have a medical certificate in order to get permission for burial. In 1906 90% of the medical certificates were issued by doctors of Chinese medicine, and certificates issued by doctors of western medicine constituted only 10% of the total. The proportion of the latter increased gradually, attained to 45% by 1917 (11:1917, p. 29). By 1920, the number of doctors of western medicine already exceeded those of Chinese medicine, and by 1935, 90% of medical certificates for the dead were issued by doctors of western medicine. Thirty years after 1906, doctors of Chinese medicine and doctors of western medicine had changed positions completely. By 1935, people did not object to injections and operations any more. On the contrary, they even believed blindly in injections, and asked for an injection when they saw a doctor. This was a remarkable change in attitude.

Farmers are tenaciously conservative in their work. In Taiwan, farmers originally used only compost and night-soil, and did not use any commercial fertilizer. When a sugar corporation started to promote the cultivation of sugar cane, they bought commercial fertilizer from Japan, and distributed it free of charge to farmers. Once a

52:Barclay S-5 (no date)1954 AD1 Formosa AD1

PUBLIC HEALTH AND THE RISKS OF DEATH

The Japanese and Public Health

165 The Japanese military forces that first set out to subdue Taiwan met no firmly organized resistance among the people, but were nearly overcome by sickness in their own ranks before taking possession of the island. Out of an undisclosed total number of troops taking part in the campaign, the Japanese acknowledged only 154 combat fatalities, but over 4,000 died of disease within the first several months, and 27,000 had to be hospitalized (most of them in Japan).[8] Epidemic illness did not, like poverty, stay confined to the Taiwanese population and leave the new rulers unmolested. Mosquitoes that carried malaria, for example, did not observe this distinction. The Japanese liking for raw fish was said to make them even more vulnerable than Taiwanese to the parasites that infested the food. Among the garrison alone, annual deaths of more than 40 per thousand were reported during the first decade of occupation, probably a higher figure than in the adult population of Taiwanese. In order to make this region of the world safe for imperialism, the Japanese found that they had to take drastic measures to curb the spread of disease.

657 They started almost at once to devise ways of counteracting the most serious sources. The steps that they adopted are instructive, for 744 the result was a marked success with only a modest outlay. The campaign against sickness was launched when scientific knowledge as to the nature of these diseases was by present standards still rudimentary. Its weapons were crude and sometimes misguided. Moreover, there were many other goals of administration that competed with public health for attention. The authorities were never in a position to divert large blocs of funds to make their program elaborate or munificent. It lacked the grandeur of projects sometimes contemplated by those who draw up plans for "backward" areas today. The whole approach of the Japanese to the problem of disease in Taiwan was an austere one. They avoided every possible expense in equipment and physical facilities, and depended on intensive use of all the administrative resources at their command.

744 In slightly over a decade the authorities almost eradicated plague as a major disease, through strict vigilance for suspected cases of infection, rigorous quarantine regulations, and careful inspection of incoming ocean cargoes for infected rats.[9] Cholera was similarly pre-

[8] Davidson, James W. (1903), p. 354.
[9] Naito, Hideo (1937), p. 84 ff.

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vented from spreading in the population by incessant search for afflicted persons, and quarantine of those cases that were found. Inoculations gradually were developed into an indispensable preventive measure against both of these diseases.

The cities, where crowded and unsanitary living conditions invited some deterioration of health standards, were made less favorable to cholera by piping in water from mountain streams and from specially constructed wells. In nearby localities, regulations were issued—and enforced—requiring villagers to tap sub-surface sources of water with deep wells that were kept covered.[7] Contamination of food supplies in the larger cities was minimized by crude provision for sewage disposal—a few septic tanks and public sewers were built, but most municipal authorities merely supervised the removal of sewage by cart. Agencies of the Sanitation Bureau regulated food handling and butchery in the public market places.

Malaria had to be attacked indirectly, and hence proved more stubborn to keep in check. It remained a source of widespread enervation and an important cause of death even during the 1930's, when measures for its control had become most effective. There were then no very satisfactory ways to kill mosquitoes or to check their breeding under conditions in Taiwan. The government drained many swamps, but the irrigation procedures necessary for the island's food supply depended on open water storage and flooding of fields.[8] The localities most frequently affected soon became known, and the authorities relied on detection and compulsory treatment of cases that were discovered. They sent special medical personnel to these districts, backed up by police power, and forced all suspected individuals to undergo blood tests and compulsory treatment with quinine. In the later 1930's, over three million examinations were regularly being performed each year. By unremitting and energetic insistence on these devices, the Japanese managed at least to prevent any large epidemic outbreak of malaria during their stay in Taiwan.

With these few outstanding dangers under control, the principal remaining causes of ill health and death were respiratory ailments and enteric disorders. As the former ceased to produce epidemics, these more common types of sickness came to account for an increas-

[7] U.S. War Department. *Technical Bulletin* (TB Med 30) (1944), p. 2.

[8] It is moreover alleged that certain types of mosquitoes bred in streams of the interior foothills. See U.S. War Department, *Technical Bulletin* (TB Med 30), p. 9.

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ing share of all deaths.[9] They were diseases that could readily be avoided by individuals whose livelihood did not continually expose them to contact with likely sources of infection, and whose income permitted them to observe simple precautions. Most Japanese were consequently protected by the nature of their occupations from the common forms of fatal illness in Taiwan. These diseases did not jeopardize their possession of the island as had epidemics in the past.

Even so, the Japanese conducted among the Taiwanese population a wide program of education and instruction in some of the simpler techniques of contending with these sources of ill health. They issued countless sanitation rules, and utilized much of their apparatus of government to enforce their observance.[10] Administratively, the health and sanitation functions of government were coordinated in several departments. In practice most of the regulations were put into effect under the authority of the police. Some trained specialists participated, bringing elements of Western medicine to Taiwan where formerly there had been none except for scattered and uncoordinated efforts of missionaries.

The level of skill among the personnel at their disposal suffers by comparison with that of modern Western countries, and it probably also fell below the standards of the more restricted public health work in some of the tropical dependencies of European powers. The strength of the system established by the Japanese, however, was in its organization and generality, and not in its equipage. It was a comprehensive program rather than a piecemeal offering of the most elaborate medical treatment.[11] Though the physical facilities of sani-

[9] For reasons that we shall come to presently, the statistics on causes of death are hard to interpret in Taiwan. They show clearly, however, a decline in malaria and the epidemic diseases, and a relative increase in deaths due to these other more insidious ailments.

[10] Indeed, it sometimes almost appeared that they used these objectives to cement their control over the population. The enforcement of public health regulations provided an excellent occasion for the police to enhance their authority over everyday activities. The Taiwanese who protested that these measures were mere excuses to interfere in the private lives of the people probably had a certain amount of justification for their charges. See Hsü Tze-wei (1946), p. 444.

[11] The Japanese did not ignore training, but assigned it a special role in their general health program. Various medical schools were established for medical instruction of Taiwanese, the first as early as 1902. The staffs of these schools and part of the faculty at Taihoku Imperial University included some competent medical specialists, but these men were retained primarily for research that had no close bearing on public health in Taiwan. Through such limited educational facilities as these and the licensing of local doctors and midwives, Japanese managed to give elementary instruction to many Taiwanese practitioners. Though superficial, the training was distributed widely enough for a striking effect on mortality.

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tation were confined to some of the major cities, the influence of these broader health measures gradually spread evenly over most of the island. In this way Japanese gained results that were very substantial through the use of none but crude techniques.

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The Japanese policy toward opium addiction was less consistent, for here they found welfare goals to be in conflict with profit motives. They made the manufacture of opium a government monopoly, and closely regulated its sale. The announced purpose for this control was to eradicate the use of the drug, but the Taiwanese occasionally complained that officials secretly abetted its consumption. The truth of the matter is not clear, but their success in other tasks suggests that opium addiction could have been stamped out far more quickly if they had made a determined effort to do so. Some of their own records show that new users of opium were being granted licenses as late as the 1920's. It is likely that the Japanese appreciated the effectiveness of addiction in enervating the resistance to their rule among wealthy families, and they made no secret of the steady public revenues that they derived from opium sales.[12]

The Evidence for Measurement of Mortality

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There is not much point in describing the purposes and methods of public health work without having some independent appraisal of results. Such efforts have often been sponsored elsewhere with much fanfare and little accomplishment. The only trustworthy way to view the results of economic and sanitation policies in prolonging life is through some form of measurement; this is likewise the only precise way of comparing the risks of death in Taiwan and in other areas.

Fortunately the data that exist to gauge mortality in Taiwan are excellent. The occurrence of many kinds of illness involving danger of contagion was required by law to be reported to the authorities. Partly as a means of avoiding contamination of the living by the dead, and partly just as a means of tightening official control over the reporting of disease, the Japanese also strictly regulated burials and cremations.[13] The rigors of enforcing these rules led to concealment of some illness and evasions by mis-stating exact causes of

[12] A careful study of opium addiction in Taiwan and its relation to mortality is contained in Tu Tsung-ming (1935 and 1938).

[13] See Hsü Tze-wei (1946), p. 449.

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TABLE 42

RELATIVE VARIATION OF MORTALITY AMONG PREFECTURES IN SELECTED YEARS

Coefficients of Variation for the Death Rates of Each Year in Table 41

Year	*Crude Death Rates*	*Infant Death Rates*	*Deaths/ Women 15-49*
1906	19.2	—	36.0
1915	17.7	13.2	27.9
1925	15.2	10.8	27.3
1930	9.6	9.3	15.2
1935	5.1	6.3	16.6

Source: Computed from data of Table 41.

conditions. Much headway was made in this process after 1925, when the life tables above revealed such large gaps in the degree of control over sickness and death. It must be kept in mind when studying mortality here and in other areas of rapid decline that initial achievement is likely not to extend to many in the population, and that later progress may be no more than bringing more types of people nearer to the same point as the ones who were privileged in the beginning.

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Taiwan formerly had a well-earned reputation as a spot of capricious and unchecked risks to life among its inhabitants. Its position athwart trading routes of the last century made it a likely place to introduce epidemic disease from the rest of Asia. As it became drawn into contact with the outside world and its wider sources of infection, the state of medical knowledge among its people did not keep pace. The former government lacked the capacity and the incentive to adopt measures that might alleviate or forestall such sickness. Taiwanese were therefore often subjected to intense attacks of these diseases, some of them becoming general over the island.

In fifty years of administration the Japanese quickly eliminated epidemics. They succeeded in gradually making the other sources of fatal illness and ill health less prevalent, and thus postponed the prospect of death for Taiwanese. While some characteristics of the decline in mortality that they induced followed familiar patterns, it also carried certain distinctive traits of the society in which it occurred. Special features like the apparent vitality of adult women

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and the importance of neonatal mortality in the decline of total infant mortality we have established with repeated observations. As far as present knowledge is equipped to deal with them, these peculiarities must remain inexplicable.

The means to this accomplishment were inexpensive and rudimentary. Aside from probably raising levels of living, the Japanese developed a concerted program against an important group of dangers to health. They attacked those pestilent conditions that can be reached through sanitation and slight reorganizations on a mass scale of practices that were deeply rooted in custom. More thorough measures, which were also more burdensome, were avoided. Their health program relied on administrative efficiency and energy in execution to make up for what it lacked in elegance of equipment and technique.

It is significant to find that such an approach could achieve the results that it did. In many other areas of high mortality the desire to reduce the risks of death is prompting steps in the same direction, and Taiwan's experience ought to prove instructive for such efforts. It is only a modest sample of what might be done in a "backward" region with effective administration—without necessarily incurring the great expense often thought to be associated with high standards of public health. Recent progress in research and development of drugs can make success more certain than before. Future strides in medical knowledge can enhance it still further.

The greatest limitation is that health promotion among people with high mortality requires constant vigilance. Default threatens such a program with collapse, for medical procedures now known are still not automatic, nor are they foolproof. Japanese measures to control disease were primarily suppressive. They did not eradicate malaria or remove the potential sources of cholera infection. Failure to appreciate these latent dangers led to severe outbreaks of cholera and malaria after the island was taken over by forces from the mainland in 1945. Since then the standards of administration, which had been allowed to deteriorate, have been raised again; with the improved technical knowledge at its disposal, the Nationalist government may be able to keep mortality at levels even below those of the Japanese period. The example of Japanese health policies, however, remains a useful lesson in what energetic measures can accomplish without the benefit of these superior medical facilities.

1:Gallin E-4,5 (1957-1958) 1966
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121 167 177 178 eastern part of the mainland to Taiwan had been going on for several hundred years, beginning in the 1600's and virtually ending about 1900 when it was almost completely stopped by the Japanese regime. Throughout the early period and even after the Japanese occupation and administration of the island, the traditional Chinese culture brought over from southeastern China was maintained with little major change.

648 178 179 178 During the Japanese occupation of Taiwan, except for the period just before and during World War II when they attempted to Japanize the island, the government tried deliberately to inhibit fundamental changes in the Chinese culture.[1] As George Barclay (1954b:32) has pointed out, during most of their occupation it was advantageous to Japanese colonialism to maintain the Chinese social and economic order which already existed in Taiwan. It was by means of the traditional Chinese system, which facilitated the maintenance of social control, that Japan was best able to function as a colonial power and to derive the greatest advantage from this area, which soon became an integral economic part of the Japanese empire. Because of this policy of maintaining and utilizing the existing Chinese social and economic system, the fifty years of Japanese rule had limited direct effect on much of the traditional social life of the Taiwanese. This was especially true of the rural agricultural areas of Taiwan, where direct contact with the Japanese was infrequent and where the Japanese had, therefore, limited influence on the cultural level of life. Some superficial changes—religious forms, for example—were in later years forced on the Taiwanese rural people by the Japanese, but they were quickly dropped when Chinese rule was restored at the end of World War II. Today, unlike the situation in the urban centers of Taiwan where Japanese cultural influence was much stronger and is still evident, only few Japanese-introduced traits can be observed in rural Taiwan, and the people attach little importance to them.

However, during the later years of the Japanese period and especially during most of these past two decades under the Nationalist Chinese, the socioeconomic impact on the whole Taiwanese population has been significant. The combination of relatively efficient government, orderliness of life, and public health measures, together with an extensive system of communications on a relatively small island has greatly facilitated rapid population increase on a stable land base and a rapidly increasing growth of urban centers.

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Out of these developments, the most significant changes for the rural population have been the extension of village contacts and involvement with urban centers far beyond the immediate village area, and, with this an increased spread of urban influences or at least their effects into the rural villages. These increasingly significant extensions

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1:Gallin E-4,5 (1957-1958) 1966
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eating, while continuing to push more food on him. When old people talk, even though the younger people may consider their words pure nonsense, they merely smile and agree. When the evening is over there is usually some young grandchild waiting to lead the old man back over the dark paths to his house.

Frequently, even though the older man has virtually retired as head of the household, he may still bear the title of *chia chang*. In such instances, it is usual for him, rather than for the son who is actually head of the house, to be elected to village positions. These positions may be political, religious, or social: the man may be charged with the arrangements for the *pai-pai* for the village god or elected *lin chang*, and so on. Although everyone knows that old men are not able to handle the extensive duties of these jobs, they are nevertheless elected by their fellow villagers out of respect. The selection is made with the knowledge that the duties and responsibilities of the position will be carried out by the man's sons, but his election tends to give the old man a great deal of face in the village. This arrangement is made possible by the manner in which elections are usually conducted in the village. Although there is an election, the outcome is usually pretty well predetermined by the families concerned, who agree before the vote is cast who will be elected and who will actually serve in the position.

ILLNESS, DISEASE, AND MEDICINE

As has already been shown in Chapter 2, the tremendous increase in population on Taiwan is a reflection of the great reduction in the death rate, which results, primarily, from the lower incidence of fatal diseases. The control of disease has been effected by such factors as public health programs which have helped eliminate diseases like cholera and malaria, an increase in the number of Western-style doctors, an increased reliance on Western medicine and medical techniques, and somewhat better sanitation as a result of education of the public and governmental enforcement of health standards.

It was during the Japanese period that Taiwan saw the advent of Western-style doctors and medicines, especially in the 1930's. However, they were few, and their practice was limited mainly to the wealthy. The benefits of their knowledge, therefore, and the everyday use of Western-style medicines did not reach many of the rural people. During this period the rural people continued to rely primarily on Chinese doctors and herbal medicines, as well as magical cures effected by shamans and healing priests. (The magical techniques are discussed more fully in Chapter 8.) However, public health measures introduced by the Japanese government to combat epidemic diseases did benefit

1:Gallin E-4,5 (1957-1958) 1966
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the rural people. Some forms of improved sanitation reached the rural areas through the schools and, perhaps more effectively, through the publishing of government edicts enforcing practices of sanitation. Semiannual government inspections forced villagers to clean up their houses and the villages twice a year. The inspections were carried out by the Japanese police and civil officials, and any family which did not pass the inspection was subject to fine and to reinspection, which meant that "the party was punished by having to clean up all over again." The policy of inspections instituted by the Japanese has been continued under the Nationalist Chinese regime.

During the latter part of the war, and especially after the restoration of Chinese rule to Taiwan, there was a marked increase in the incidence of disease, particularly communicable diseases. There was even a recurrence of cholera. This was a direct result of the poor living conditions brought about by the war and, with the coming of the Chinese government, a chaotic administration which was unable or unwilling to deal with health problems. However, the situation gradually began to improve after 1948 and 1949 when Taiwan became the new stronghold of the Nationalist Chinese regime. This improvement is evidenced by the general situation in the Hsin Hsing area. Beginning in the early 1950's the number of Western-style doctors practicing in the area increased. At this date, there are a number of such doctors, and the villagers consider their fees reasonable and within their means. The reason for this great increase lies in the different licensing practices of the Japanese and the Nationalist governments. Under the Japanese a man had to be a graduate of a medical school before he could practice medicine; under the Chinese government, the applicant is required only to pass a practical examination. This means that people who have worked in hospitals as aides or technicians and have had some opportunity to observe others practicing medicine may have accumulated enough knowledge to pass the examination and obtain a license. Therefore, while there are now a large number of licensed doctors practicing in the Hsin Hsing area, only a few who went to school in Japan have had formal medical training.

In addition to the great increase in the number of doctors practicing in the local area, in recent years there has also been a marked expansion in the number of private and public hospitals in the cities. These hospitals, which are sometimes very large, can accommodate many patients, house relatively modern facilities such as operating rooms, X-ray and other equipment, and provide modern drugs for patients. Although most of the patients treated in these hospitals are city people, village people sometimes go to them for treatment. They are usually referred there by a local doctor who is capable of diagnosing an illness as one requiring hospital care or who is honest enough to

1:Gallin E-4,5 (1957-1958) 1966
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ment of the local area. In such villages, composed of a single large *tsu* organization, the *tsu* could virtually control the lives of its member families, unite the entire village population on the basis of common kinship, and thus furnish security to all its members. But even villages like Hsin Hsing, fragmented into many small kinship groups, found their security in complete identity with the village, which made it possible for them to band together and cooperate for mutual security against the everday dangers and problems.

The coming of the Japanese at the end of the nineteenth century saw the introduction of a strong central government which led to an increased orderliness of life. The Japanese also introduced an expanded and efficient system of communications and public health and sanitation measures. These measures, coupled with a stable and secure life, made possible a radical increase in population which became even more pronounced in the late 1940's and 1950's under the Nationalist Chinese government. As all of these developments took place, particularly the maintenance of local order, the ties of the village began to loosen with the loss of its protective function and ability to initiate control beyond its own village boundaries.

In Hsin Hsing (and probably other villages like it), some of the numerous kinship groups began to increase in size and develop into *tsu* organizations as described in Chapter 5. With growth, each group became increasingly concerned with its own sociopolitical influence within the village and even in the nearby area, especially as the former imperative necessity for village unity declined. Thus, Hsin Hsing began to develop into a village with several significant competing *tsu* organizations which started, to some degree, to undercut the formerly necessary coalition of the different village kinship groups. So began the weakening of Hsin Hsing village as a unified community.

As the population increase continued in recent decades, and an already developing problem of land scarcity became even more extreme, it gradually became both necessary and possible for increasing numbers of rural villagers to migrate to the growing cities to find work to supplement their insufficient income from the land. This migration has broadened the villagers' urban contacts and relationships beyond the village. At about the same time, as we have seen in earlier chapters, the villagers have become increasingly more dependent upon and involved with the greater market economy. This has become especially true as patterns of land use have changed in response to all of the changing conditions, so that many villagers are increasingly shifting from what was primarily a subsistence form of agriculture to what is now participation in the market economy of the country. Therefore, there has been an acceleration of the impingement on the village by the outside world.